

University Business Start-up: What Happened to the Ivory Tower

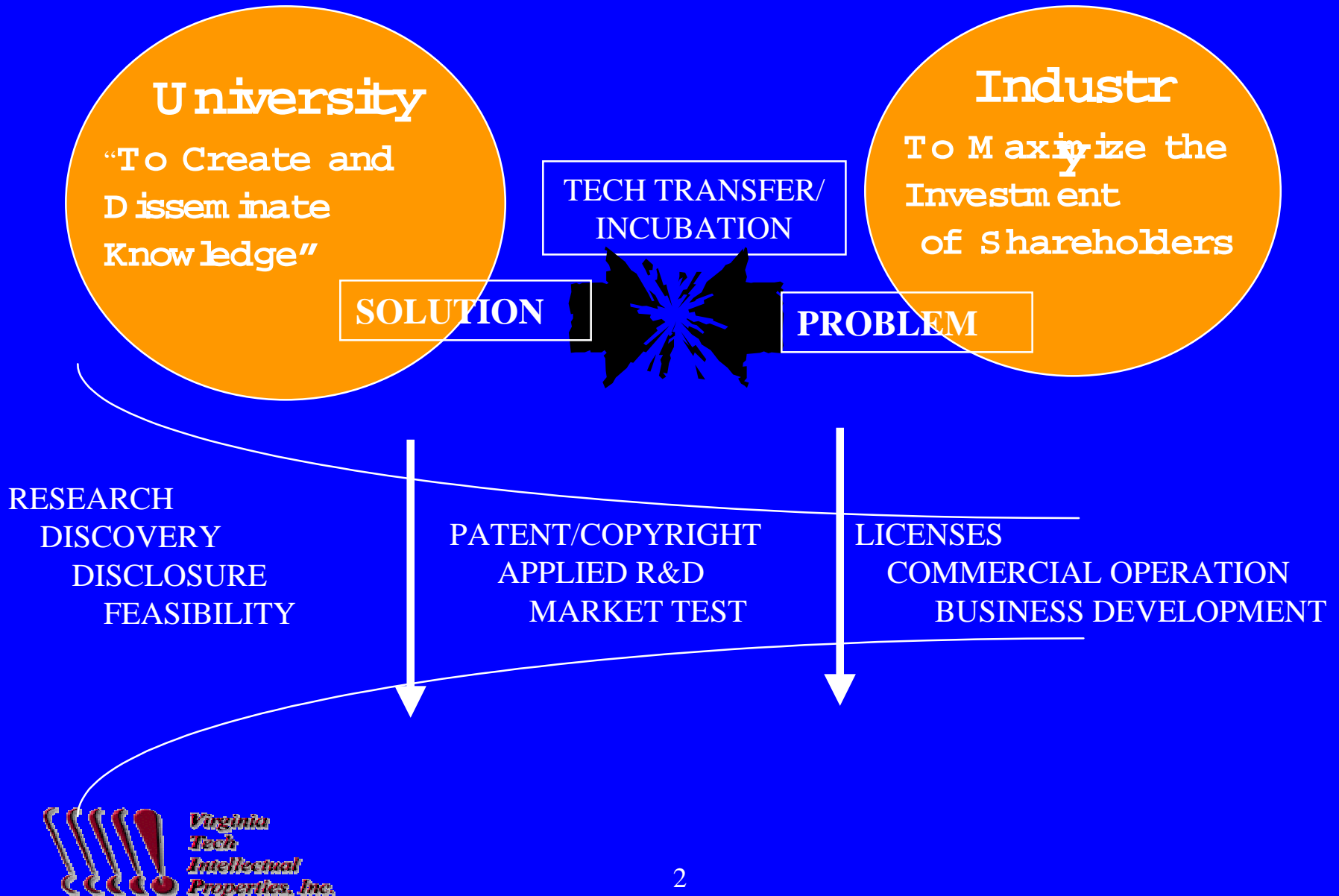
Michael J. Martin

Executive Vice President

Virginia Tech Intellectual Properties, Inc.

June 11 2002

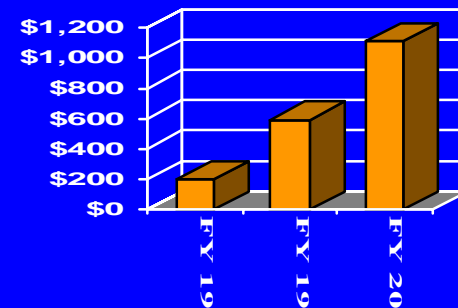
Industry/University: Bridging Two Cultures



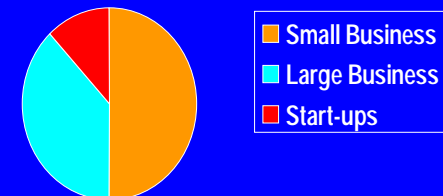
Why Tech Transfer: University " Create and Disseminate Knowledge THROUGH .. New Products and New Businesses"

- From Morrill Act to Bayh Doyle Act - 1980
- Outreach mission of university will continue to expand
- Number of entrepreneurial faculty will increase
- Results
 - \$40 billion in economic activity that supported more than 270,000 jobs
 - 368 Start-ups and 3606 licenses in 2000

Universities Reporting to
AUTM
Licensing Income
(millions of dollars)

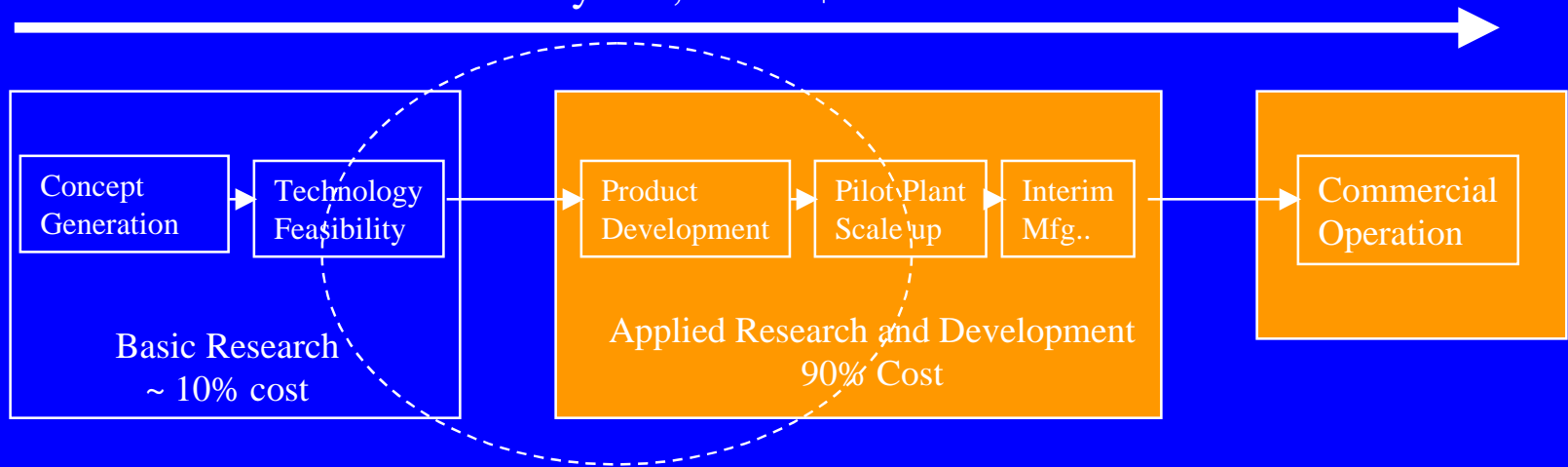


% Licenses in 1999



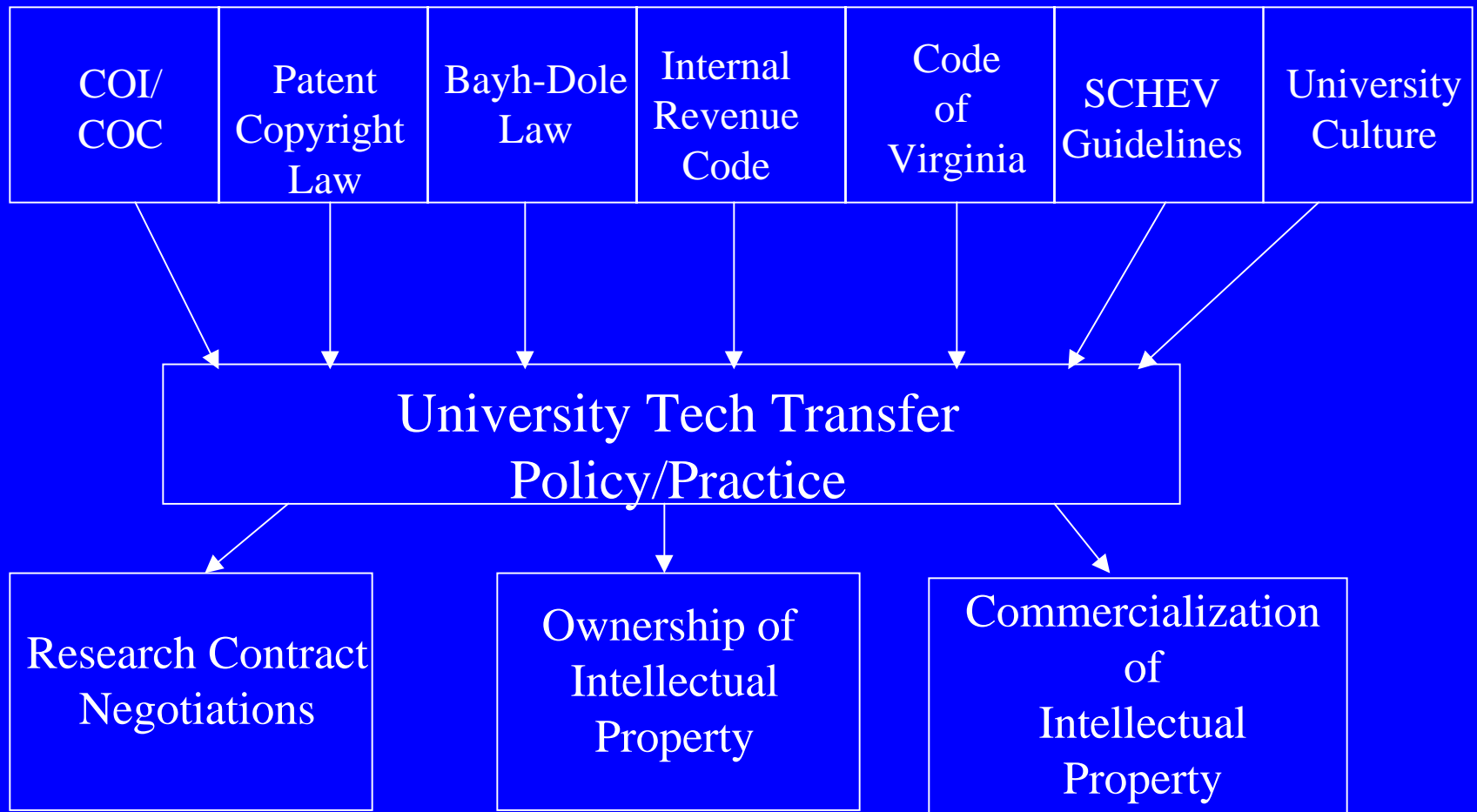
Culture for Entrepreneurship: Permission to Fail

3 to 10 years; 0.5 to \$20 million

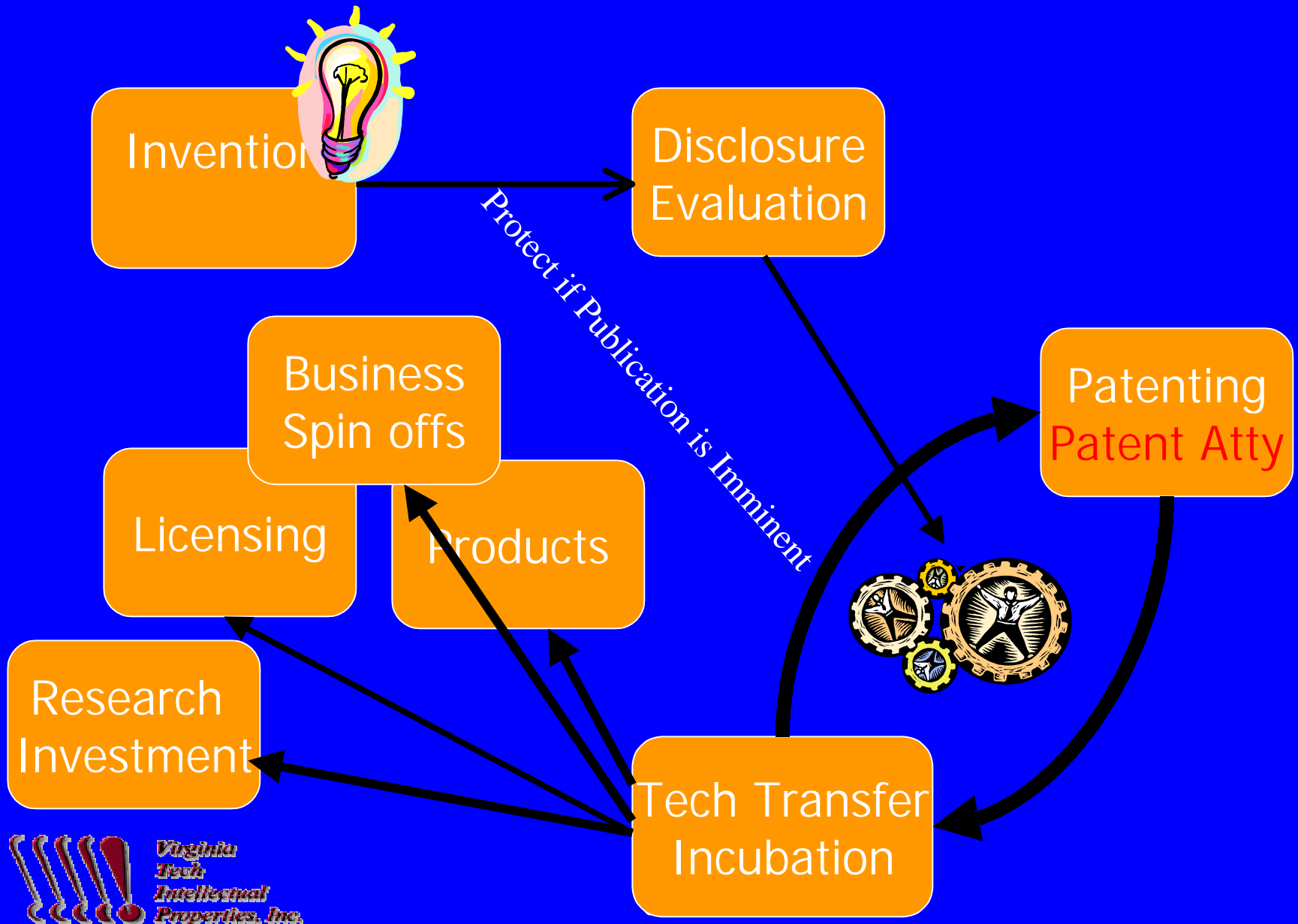


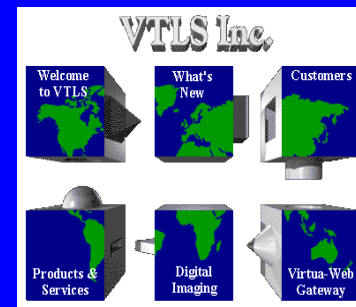
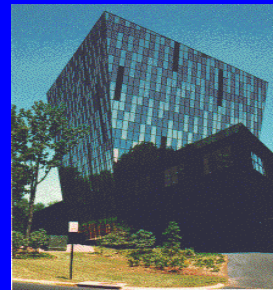
- Where is the University Administration : Creative Destruction?
- Conflict of Interest: State Law and University Policy:
- Access to: Patient Risk Capital; Business Start-up Services; Appropriate.

University Tech Transfer Policy/Practice



TECH TRANSFER: COMPLEX SYSTEM





Virginia Tech

"Putting Knowledge to Work"

Culture for Business Start-up/Incubation

"Enabling Knowledge to Work"

- Largest University in Virginia - 25,000 Students, 1600 Faculty, \$148 Million Research Budget, 40 % of Graduate Students in the State
- University Policy and Practices to Encourage Entrepreneurship : "Direct experience in entrepreneurship allows the faculty to impart real world experience to students. The center interacts with these Virginia companies to enhance technology transfer and increase the competitiveness of Virginia's biotechnology industry." Tracy Wilkins, Director Fralin Biotechnology Center.



Access to Appropriate Space: Corporate Research Center

- Demographics:
 - 105 tenants, 1800 employees
- New Construction:
 - RB 14, 15, and 16
 - Via School for Osteopathic Medicine
- Selection to join “it-parcs” Best research park in the world network
- Implementing new 1 gigabit backbone (100 megabit service to the desktop).
- Chat Room Café and Weight Club are big successes.



Access to Management: Subsidized Services & Sweat Equity



- VTIP refers the disclosure to KnowledgeWorks
- Partners license technology for start-up
- Or, Partners provide VTIP with analysis



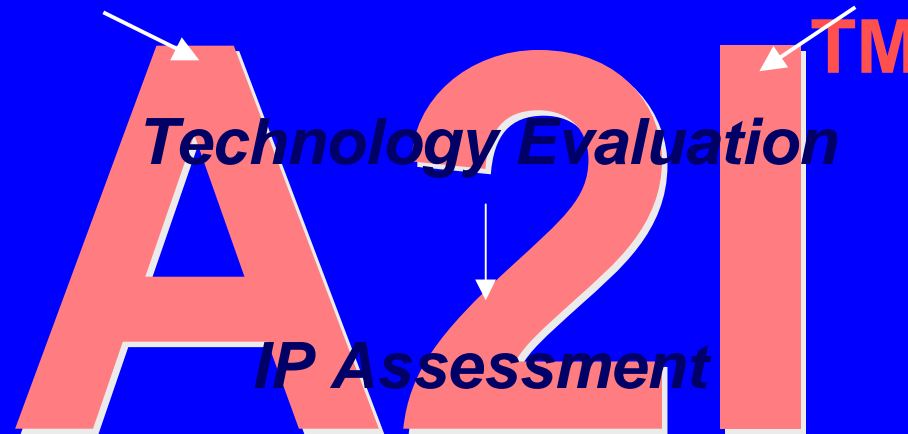
- Provides subsidizes services for Start-up
- Conducts valuation analysis for VTIP



KensaGroup's A2ITM Process

*Strategic University
Relationships*

*Regulatory Issues
and Economic Stimuli*



Technology Evaluation

IP Assessment

Marketing Plan

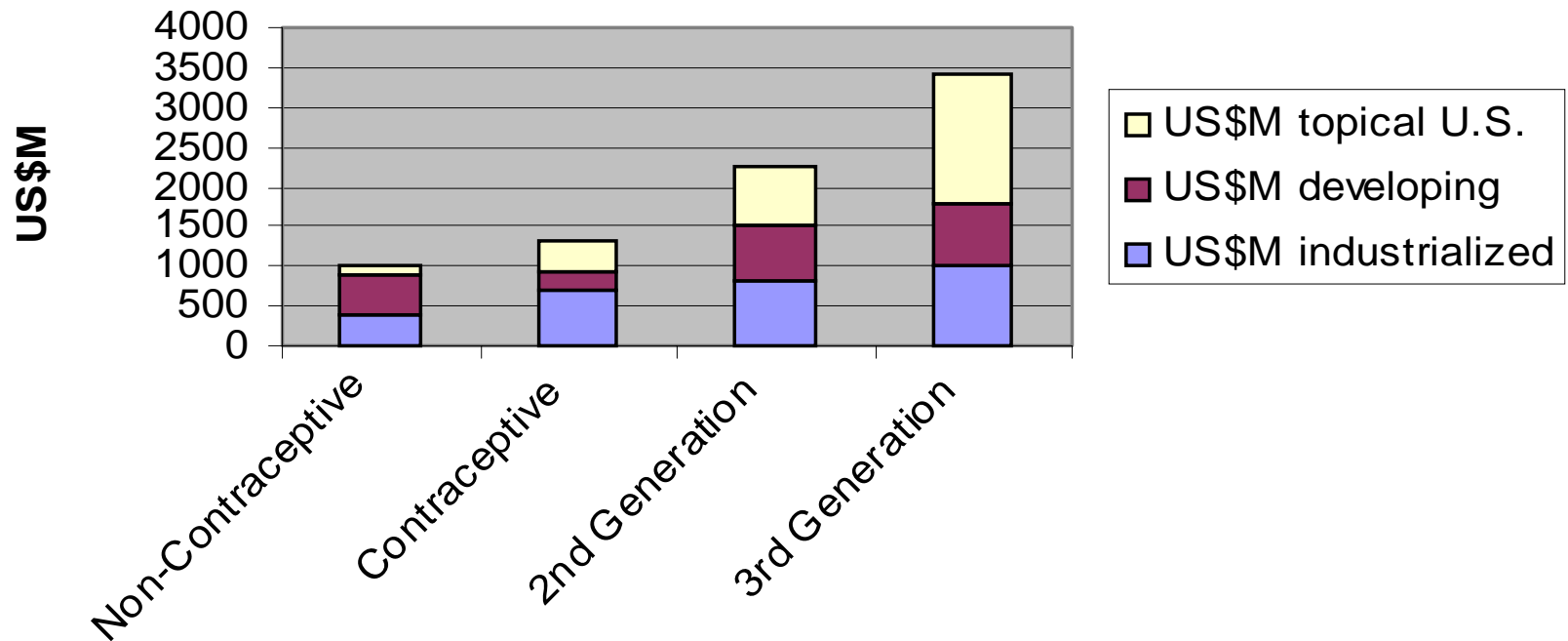
Business Plan

Myconyx and the KG Process

Market Study

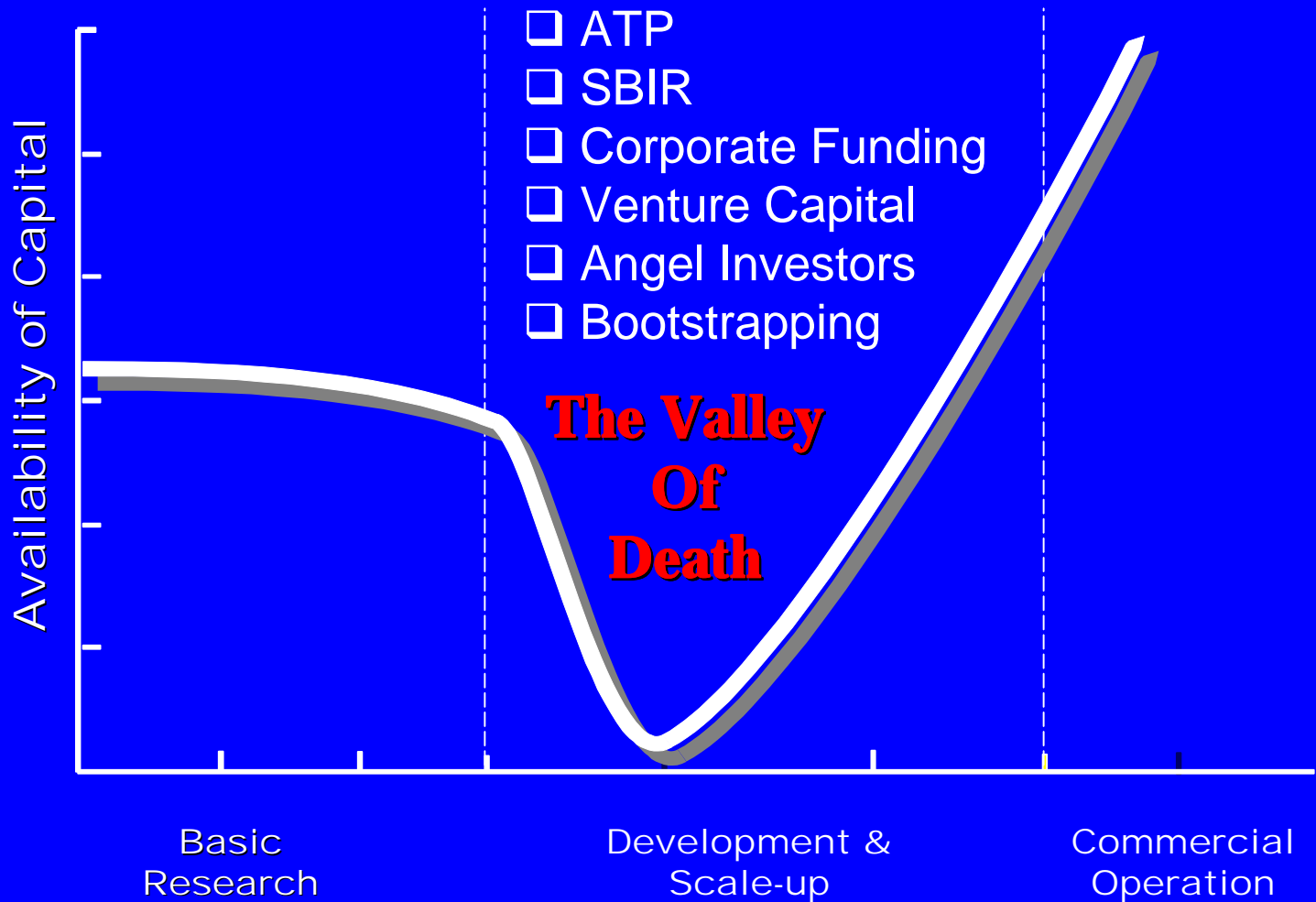
A multi-billion dollar market opportunity

Market Potential-Topical Microbicide



Access to Capital: Technology Policy Framework

Source: *Richard Palmer, Business Specialist Advanced Technology Program National Institute of Standards and Technology*



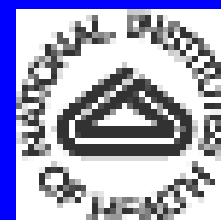
Access to Ideas:

Research Centers Enable the Creation of Business

- CPES: ERC with 4 other universities
 - **Solitronics**: Based on Emitter Turn off Thyristor
 - Fiber Optic Research Center
- SBIR/STTR/ATP/Federal Grants
- **Prime Photonics**: High Pressure- Temperature Sensors for the Gas Turbine and Oil Industries
 - **Luna Innovations**: High Sensitivity (parts/trillion) Biological and Chemical Sensors
 - **NanoSonic**: Large, Flexible, High Intensity Displays

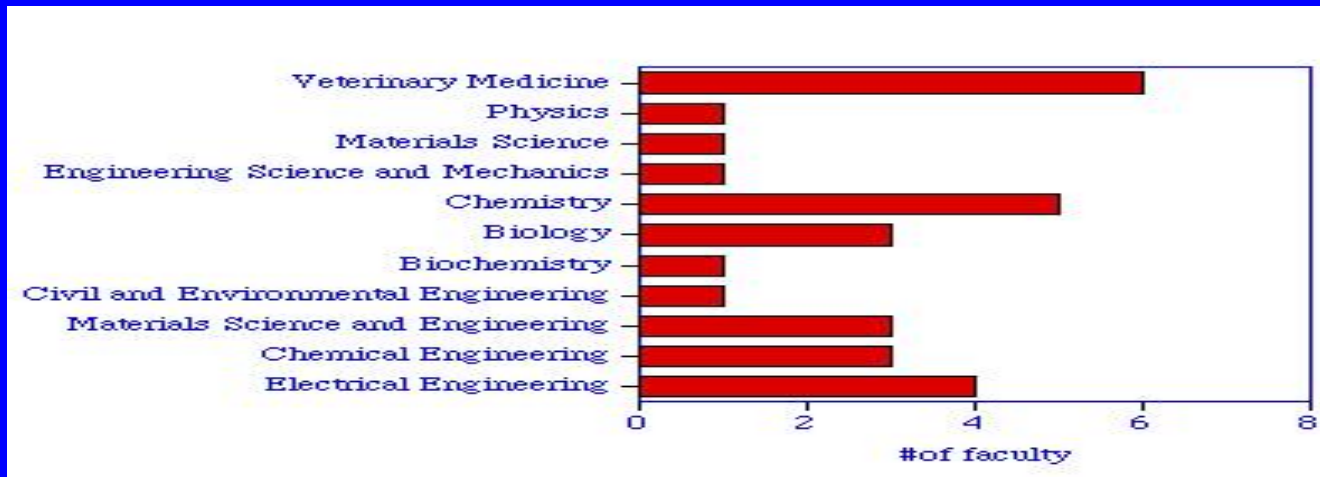


Small Business Funding Opportunities



Incubate New Research Partners: Carilion Biomedical Institute

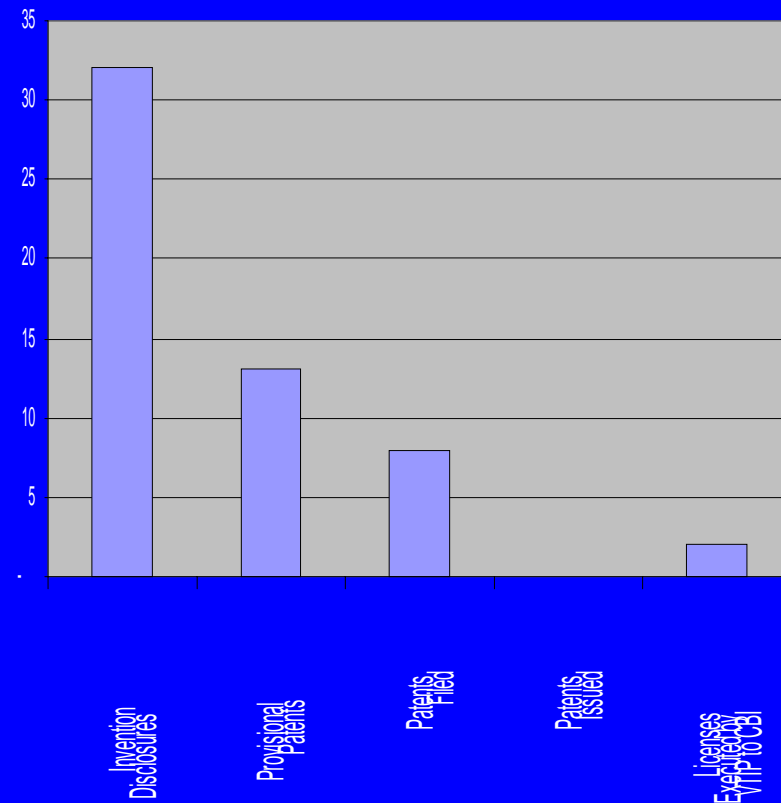
to foster the development of new knowledge, processes and products in the biomedical sciences area and to facilitate the transfer of that knowledge into improving the health status of the region and the world while providing economic development activities in Virginia



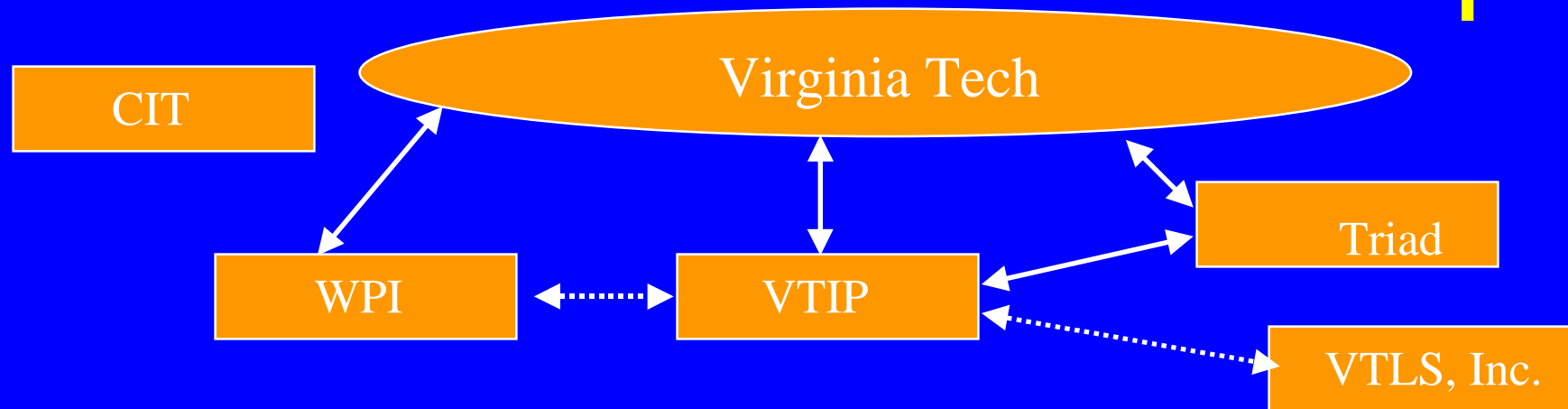
The Institute has 3 Major Goals

- To enhance the research stature and reputation of the University of Virginia, Virginia Tech, and the Carilion Health System.
- To enhance the health status of the region through focused research and development.
- To create economic development activity in the region.

Results of CBI Research Funding



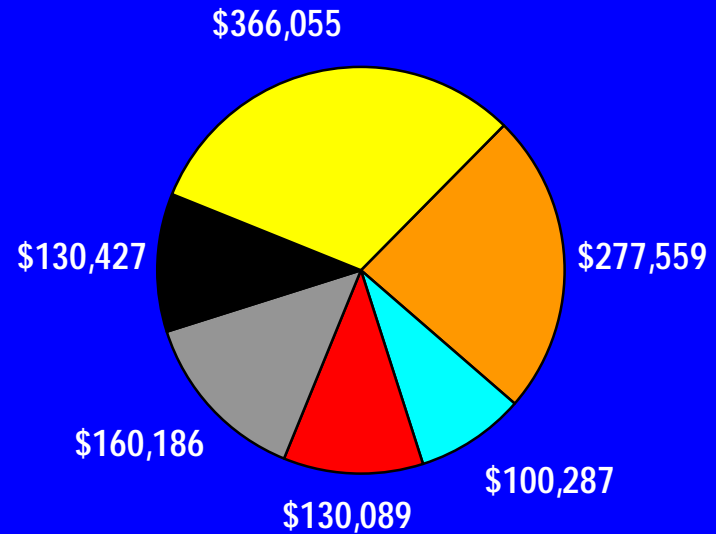
Tech Transfer: Business Start-ups



- Established in 1985 as a separate affiliate corporation
- Mission: "Support Virginia Tech by maximizing return to the university from its research investment by balancing:
 - service to the university and society by identifying, protecting, marketing, and licensing the intellectual property of the university;
 - income generated by licensing intellectual property;
 - sponsored research funding from licensees;
 - creation of new or start-up businesses and jobs; and
 - dissemination of university expertise to society"

Access to Capital: VTIP and Triad

- Review Portfolio for Early Stage Discoveries
- Investment in Developmental Projects on Campus
- Create Investment Grade Technologies
- Broaden investment opportunities
- Time too short for ambitious financial goals



Triad Project Funding

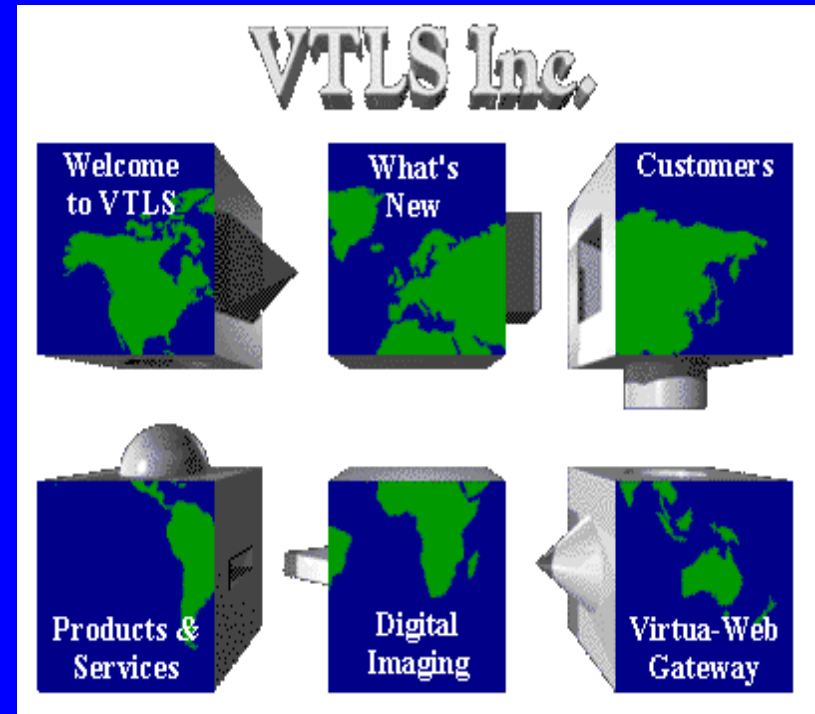


Access to Capital: “University” VC

	Pre-Seed	Seed	Early Stage	Mid-Stage	Exit
Description	▪ Invention/Raw Technology	▪ Prototype/ Product-in-development	▪ Product at beta clients	▪ Full customer pipeline	▪ Business Expansion
Team	▪ Technologist / founder/business development	▪ Plus first senior mgmt team member	▪ Senior mgmt team formation	▪ Senior mgmt team in place	
\$ Needed	▪ <\$500K	▪ \$250K to \$1M	▪ \$1M to \$5M	▪ \$2M to \$20M	▪ Public Markets
Keys to Success	<ul style="list-style-type: none"> ▪ Identifying technology via relationships ▪ Determining commercial viability ▪ Accessing rights ▪ Dev. business strategy 	<ul style="list-style-type: none"> ▪ Finding development partners ▪ Developing business strategy ▪ Recruiting BOD & SAB ▪ Recruiting CEO 	<ul style="list-style-type: none"> ▪ Growing the sales pipeline ▪ BOD and SAB in place 	<ul style="list-style-type: none"> ▪ Managing growth ▪ Achieving profitable ▪ Identifying exits 	

Access to Capital: For-Profit Subsidiary VTIP and VTLS

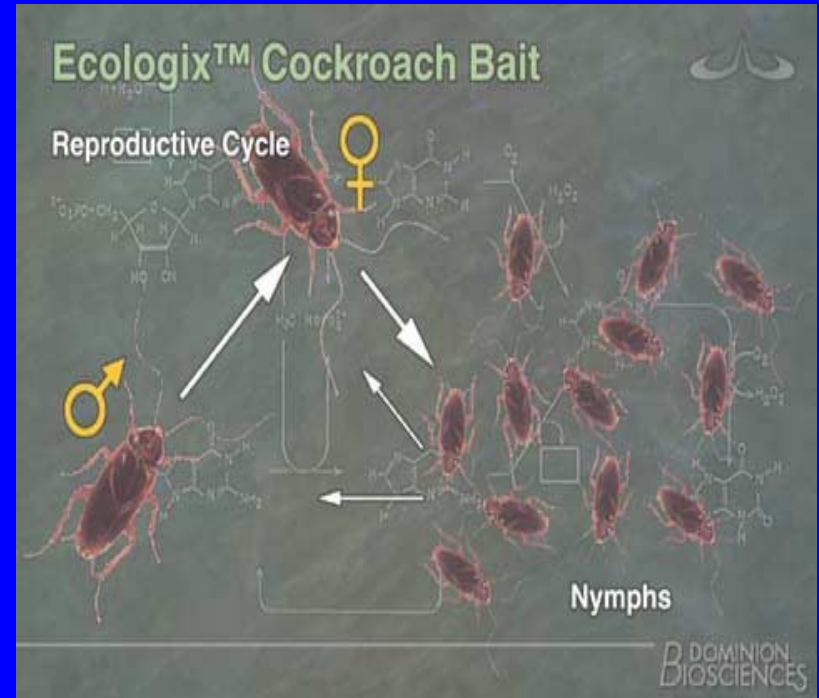
- Established as a for-profit subsidiary of VTIP in July 1985; VTLS was divested in 1994.
- Today, VTLS has over 400 customers located in 33 countries with annual sales of \$10 million.
- Revenues from sale of VTLS were invested in a venture capital fund and retained for future growth of VTIP.



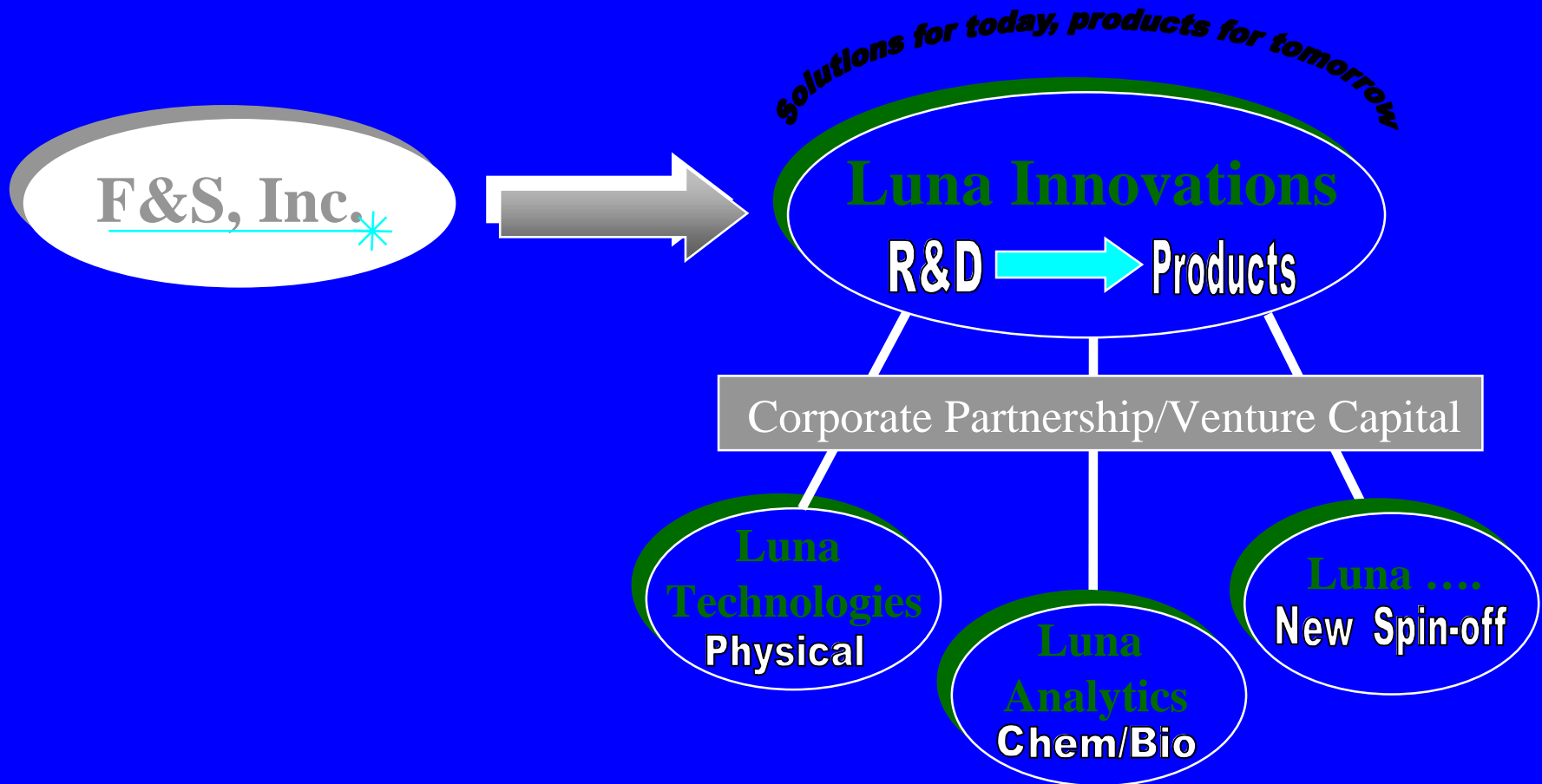
Access to Ideas :

Dominion BioSciences, Inc.

- Early Stage Company developing and commercializing non toxic biopesticides.
- Ecologix™ Cockroach Bait - nutritional metabolism disrupter.
- Licensed from VTIP.
- Virtual Company: Synthon, CRC tenant, manufacturing a key ingredient; and a strategic partner is distributing.



Incubate Businesses: Luna Innovations



Universities

Government

Industry

Ideas & Funding

LUNA INNOVATIONS

Private & Industrial

\$

LUNA Technologies

LUNA nanoMaterials

LUNA Analytics

Acquisition & IPO

Access to Capital: Center for Innovative Technology

- CIT created by the General Assembly of Virginia in 1984 to enhance the research capability of the state's major research universities.
- Now mission is "Jobs, Companies, and Competitiveness"
- Originally, CIT licensed directly, taking equity.
- Now, they co-fund development at the Universities.



Sources of Capital

Sources of Initial/"Seed" Capital	
Entrepreneur's Personal Savings*	74%
Angels	7%
Strategic Corporate Investment	6%
Family & Friends	5%
Venture Capitalists	5%
Public Stock Issues	3%
Commercial Banks	0%
TOTAL	100%
Source: E.B. Roberts	

* Note: Don't Over leverage yourself!

Venture Capital Summation



- Maximize ROI by minimizing the risks on investments in private companies
 - Management Team
 - Intellectual Property
 - Sustainable competitive advantage
 - Huge & growing markets

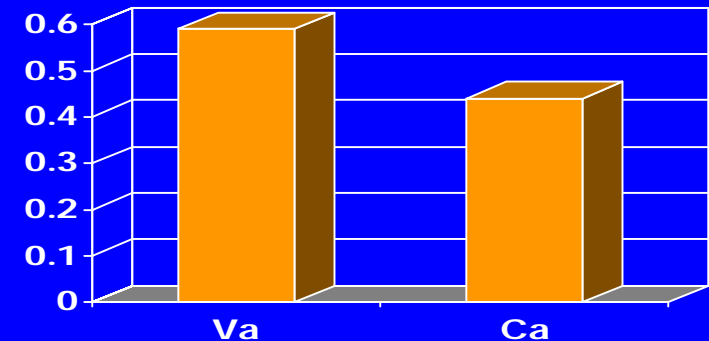


“We need a bullheaded yet friendly individual for a highly repetitive and completely thankless job. They should be willing to take extreme pressure from both sides of a negotiation, accept terms that make no sense as political presses require, and fully accept blame for all unfavorable outcomes from such decisions. Now the salary would be commensurate with low-level administrative positions which require none of these skills. Interested?”

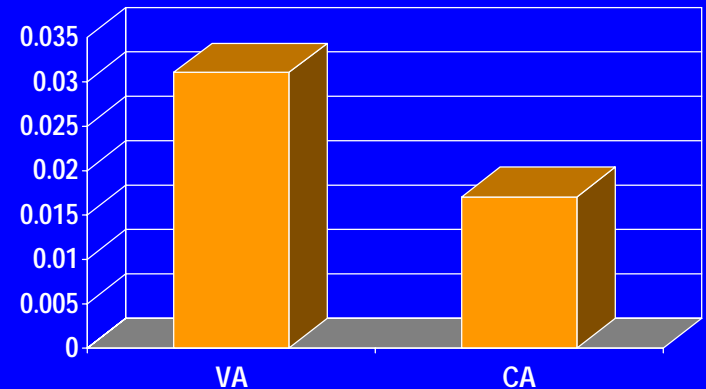
Requirements for Business Formation

- Culture: Creative Destruction
- Access to: Patient Risk Capital, Entrepreneurial Management/Services, and Appropriate Space.
- Entrepreneurial Faculty

Ratio of Disclosures to \$ million Research (FY2000)



Ratio of Start-ups/\$ million of research



Opportunities/Issues

- Opportunity
 - Encourage Economic Development
 - Attract/Retain Entrepreneurial Faculty
 - Protect Right to Publish
 - Another Form of Dissemination/Outreach
- Issue
 - Conflict of Interest/Conflict of Commitment
 - Everything is for sale
 - Forget students
 - Public vs. Private Competition
 - IRS, Federal Regulations, Law Suits

